DOCUMENT RESUME

ED 444 173 CS 217 223

AUTHOR	Knobel, Michele; Lankshear, Colin
TITLE	Ways with Windows--What Different People Do with the Same Equipment.
PUB DATE	1997-00-00
NOTE	28p.; Paper presented at the Annual Meeting of the Australian Association for Research in Education (Brisbane, Australia, November 30-December 4, 1997).
AVAILABLE FROM	http://www.schools.ash.org.au/litweb/ways.html.
PUB TYPE	Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE	MF01/PC02 Plus Postage.
DESCRIPTORS	Case Studies; *Computer Uses in Education; Educational Policy; *Educational Practices; Educational Research; Elementary Secondary Education; Foreign Countries; *Language Arts; *Literacy
IDENTIFIERS	Australia; *Critical Literacy; *Educational Issues; Technology Integration

ABSTRACT

The clamor to integrate computer-based technologies into curriculum generally, and language and literacy education specifically, is a hallmark of current education policy in many countries. A perceived need for education to keep pace and in "sync" with labor market needs is obviously an important part of the story. Technology and progress have become indissolubly linked in the minds of many parents, students, educators, and policymakers. Expressions of pressure to equip classrooms and the need for teacher professional development to enable them to use the technologies are encountered on an everyday basis in Australia. This paper addresses three main questions: What kinds of differences can be found in different peoples' "ways" with similar computing hardware and software as they pursue social and cultural purposes in a range of settings? Can these differences usefully inform education policy and practice? and Do they have significant implications for language and literacy education specifically? The paper uses four "snapshots" drawn from larger case studies of computer-mediated practices in different sites; one draws on a year 5 classroom in a country town, while the second and third snapshots depict contrasting ways of producing computer-generated slide show presentations, and the final snapshot focuses on some characteristic ways a group of students from an inner city state school were participating in activities at a nearby community and youth space. It concludes that whatever else is done pedagogically with the new technologies, the aim should be to integrate them into informed practices of critical social literacy. (Contains 29 references.) (NKA)

Reproductions supplied by EDRS are the best that can be made
from the original document.

http://www.schools.ash.org.au/litweb/ways.html

ED 444 173

"Ways with Windows - What Different People Do with the Same Equipment"

This article by Michele Knobel (Lecturer in education) and Colin Lankshear (Professor of Education) is the text of the invited keynote address to the 1997 Australian Literacy Educators' Conference, Darwin

Introduction

The clamour to integrate computer-based technologies into curriculum generally, and language and literacy education specifically, is a hallmark of current education policy in countries like our own. This, of course, is merely the most visible manifestation of a wider, pervasive technologising of education that has intensified and become brashly explicit in recent years; the latest incarnation of the perennial dream of enhanced human progress courtesy of refined technique. Indeed, the techno emphasis is so strong at present that Stanley Aronowitz and Henry Giroux (1993: 63) do not exaggerate when they claim that "the whole task set by contemporary education policy is to keep up with rapidly shifting developments in technology".

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☐ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

BEST COPY AVAILABLE

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY
C Lankshear
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

CS 217 223

In North America, policy statements and reform initiatives from the time of *A Nation at Risk* (National Commission on Excellence in Education 1983), through to President Clinton's Technology Literacy Challenge (Winters 1996) have consistently emphasised the need for a technologically literate population. President Clintons most recent *State of the Union Address* (Clinton 1997) spells out strategies for ensuring that "all Americans have the best education in the world "(ibid: 4), including - as a key strategic plank - ensuring that over the next four years all 12 year old students and above are connected to the Internet. By the year 2000, "children in the most isolated towns, the most comfortable suburbs, the poorest inner-city schools will have the same access to the same universe of knowledge" (ibid: 7; Winters 1996). Physical access to computer-mediated communications technologies is heralded as the "modern birthright of every citizen", with Clinton rallying the US to take action to bring the power of the information age into all our schools. The *State of the Union* speech clearly establishes a fast track agenda for technologising classrooms, and language and literacy education in particular, during the next four years.

Here, in Australia, the recently released draft of the new National Literacy Policy interweaves literacy, technology, and economic wellbeing and growth, claiming (Kemp 1997: 6-7)

"At a time of rapid technological change and pervasive internationalisation literacy skills contribute to the increased competitiveness and productivity that the national economy demand ... [The policy aims to extend] an active critical, productive and engaging literacy in the complex and mixed modes in which literacy is embedded in Australias rapidly changing technological, cultural, and economic circumstances."

A perceived need for education to keep pace and in 'sync' with labour market needs is obviously an important part of the story. Claims about the escalating dependence of work and other daily tasks and processes on computer-mediated text production, transferral, and reception are foregrounded in prominent references to 'technological literacy' and 'technologised curricula '(c.f., Bigum and Green 1992; Green and Bigum 1996; Lankshear and Knobel 1997) within educational reform statements here and abroad. There is more to it, of course, than simply turning out suitably prepared *workers*. Of at least equal, if not greater, importance is the need to constitute vast masses of *consumers* (see Montgomery 1996 for a timely account of children as targeted consumers within marketing cultures of cyberspace). New electronic technologies directly and indirectly comprise key products of postindustrial information and service economies. Direct products include all manner of hardware and software, for which worldwide markets need to be generated and sustained.

Indirect products include information and communications services such as Internet access provision, on-line ordering and purchasing facilities, manuals and guides, networking and repair services, web page design, and so on. Educational reform agendas serve crucially here as a means to creating and maintaining enlarged markets for products of the information economy - extending beyond curricular exhortations to advocate also the extensive use of new technologies within administrative tasks of restructured schools (Kearns and Doyle 1991).

Technology and progress have become indissolubly linked in the minds of many parents, students, educators, and policy makers. Schools are investing heavily in hardware, software, Internet connections, local area networks, and so on. Increasingly, we hear of parents choosing schools for their children on the basis of Internet access. Such practices and mind sets evince a "widely held discourse which associates computers in classrooms with technological progress, future employment opportunities of students, as well as enhanced learning in the classroom "(Bigum and Kenway 1997: 2).

Policy initiatives, commercial and civic strategies, and ideological investments are working in concert to facilitate - although *coerce* might be a better word - the intensified educational uptake of new technologies. Chip Bruce (1996) identifies three widely-held interlocking beliefs underlying contemporary faith in the educational and social efficacy of new technologies. These beliefs simultaneously suggest a straightforward agenda for realising the alleged potential of new technologies. They are:

1. Education has an essential role to play in meeting major challenges and concerns facing human beings. Accordingly, improving education is seen as being large part of the answer to current ills (c.f., Bruce 1996: 3-4). There are two sides to this conviction. On one side, when things go wrong - such as economic recessions - education bears much, if not most, of the blame: the corollary being, "fix education and you fix the rest". On the other side, educationists are constituted - and otherwise feel a need, especially in periods of fiscal strain - to promote the view that education is integral to improvement, and that the role of the teacher is complex. The obligation educators widely feel to take on social improvement/amelioration roles beyond the strict confines of classroom teaching and routine administration of learning tasks is captured in Illich's (1971: 37) conception of *school* defining teachers institutionally as custodians, moralists, and therapists.

2. If education is a/the key to social and cultural wellbeing and advancement, computer-based technology is, in turn, the key to educational improvement. Bruce (1996: 4) notes that "computer technology is [seen as] a tool that will in and of itself improve education, and ultimately ameliorate social ills".

3. Computing technology is simply *a tool* - and a *benign* tool at that. Hence, it is believed, there are really only two major issues to be addressed, or conditions to be met, as bases for realising the benefits of new technologies: (a) ensuring universal access to computer technology; and (b) providing adequate training in how to use it (ibid: 4).

This is especially apparent in Australia right now, where we encounter, on an everyday basis, expressions of pressure to equip classrooms and of the need for more teacher professional development to enable them to use the technologies.

As exemplified in President Clinton's address, access is for the most part framed in physical and quantitative terms: viz., availability of appropriate hardware, software, and wiring. Policy is often reduced to issues of cost and strategies for addressing provision. This is reflected in the reductionist view of 'information rich' and 'information poor '- defined in terms of whether there is a computer in the classroom and/or at home. We do not want to imply that these are unimportant matters. Rather, we want to use empirical cases to explore and document some of the ways in which they are radically incomplete. At the same time, we need to demystify the 'magic bullet', 'quick fix' mentality bound up with prevailing views of access and, in its place, develop and adopt informed and principled stances on the role and place of computing technologies in education. This need was reinforced on the very day of drafting this section of our paper. An Education Adviser at a Brisbane school support centre phoned seeking references to theory and research germane to her growing concern that request after request for funding under the disadvantaged schools component of the National Equity Program Scheme amounted to 'projects 'for putting Pentiums on desks in classrooms.

Similarly, problems emerge around the concern for adequate training: that is, the idea that teachers and students have to 'learn how to use it' [viz., computer technology]. So far as teacher competence goes, the training concern is often shamelessly reduced to aspects of technical knowledge, and producers of professional development packages are urged to provide content for 'technologically illiterate teachers' as a first priority. Accompanying this, we find lists of skills and

competencies to be mastered by students at various year levels being plugged into curriculum and syllabus statements, frameworks and profiles: yet another instance of applied technocratic rationality (Lankshear 1997). Such notions of 'learning how to use it' imply some kind of essence and autonomy to the technology: that it is somehow self-contained, with its own independent integrity, and that to unlock its potential and power is a matter of particular kinds of learning (uncovering its secrets). Here, too, we want to complicate matters a little by drawing on some cases we have observed within school and out of school settings.

Orienting questions

This paper addresses three main questions.

1. What kinds of differences can be found in different peoples *ways* with similar computing hardware and software as they pursue social and cultural purposes in a range of settings?

2. Can these differences usefully inform education policy and practice?

3. Do they have significant implications for language and literacy education specifically?

Four sites of practice

These questions are taken up by reference to four 'snapshots 'drawn from larger case studies of computer-mediated practices in different sites. One draws on a Year 5 classroom in a country town. The school is currently classified as a Band B1 disadvantaged school (qualifying it for limited additional funding support), although three years previously it was classified Band A and, subsequently, Band B. Our account distils elements of the characteristic *ways* by which the class undertook a unit of work based on the theme of inventions. The second and third snapshots depict contrasting ways of producing computer-generated slide show presentations. The final snapshot focuses on some characteristic ways of a group of students from an inner city state school who were participating in activities at a nearby community

and youth space, with learning assistance from site-based program directors and some of their own teachers. These activities used cyberspaces and online imagery to explore identity, culture, and language.

The various participants in these four sites were using more or less equivalent electronic infrastructure. They were all working at or above a hardware baseline of 486 harddrive processing speeds (or Apple equivalent). Only the home-based participant was working with a Pentium powered (or equivalent) machine at the time. All were using comparatively up to the minute word processing packages. Scanners were used in each case and digital cameras in three of the four. The participants who were producing slide shows were using equivalent Apple HyperCard and Microsoft PowerPoint software respectively. Three of the four were using the Internet/World Wide Web on a regular basis in their activities, and this was not a crucial variable in the case that wasnt. Hence, to all intents and purposes, the four snapshots draw on equivalent infrastructure, although by no means equivalent *access* to that infrastructure, or, as we will see, ways of using it.

While we can hold infrastructure roughly constant, there were some notable differences among the four cases. Two took place in school settings, the third in a private home (albeit with input and feedback from a peer group in and out of school), and the fourth in a community setting. The school-based cases themselves differed from each other. One was a full-blown curricular program. The other was an extra-curricular project, loosely coupled to prior learning within formal classroom subjects, with the student participants all coming from Year 8 to 10 classes taught by the teacher who was coordinating the project. Finally, the two slide show productions differ in that one was an entirely self-directed individual pursuit, which amounted to an open-ended personal hobby interest. The other was a 'moderately coerced ' team effort oriented toward producing a functional outcome (of limited intrinsic interest to the student participants) under severe constraints of time and availability of equipment.

In search of "ways"

We have taken the idea of "ways "as a framing device for this paper from two sources. The more obvious, of course, is Shirley Brice Heaths classic work, *Ways with Words* (1983). Heath's research provided invaluable insights into varying cultural productions of language within specific home and community sites, and the relationship between these varying cultural productions and patterns of success and

failure within formal institutional (school) settings. The second is Ursula Franklins (1990) concept of technology as practice, where 'technology' is construed generically as a shorthand for ways of doing things, or getting things done, socially and culturally.

From these perspectives, 'ways' is not a simple concept. The following anecdote, provided by a friend, captures some of the complexity and illumination we seek. He told us that when his wife prepares the pork roast for Christmas she always removes the lower leg portion before putting the meat in the baking dish. One year, while watching her prepare the roast, our friend asked her why she cut the leg the way she did. She replied that this was the way her mother always prepared it. Intrigued by the reply he asked his mother in law, a little later, when all the family was seated at dinner, why she used to prepare the roast that way. She in turn told him that her own mother had always done it that way. His mother in law duly turned to *her* mother and asked why she had prepared the roast that way, to which she replied that the only baking dish she had owned had always been too small for the roast, and so she had cut the meat that way to make it fit.

'Ways' involve routines and customs characteristic of particular communities of practice. They are related to goals and purposes, and draw on funds of knowledge (Moll 1992) available to participants. Different groups/communities of practice may develop different ways around what appear to be much the same social practice. These differences, however, take on important lives of their own. For example, different ways of engaging in what seems to be the same broad practice may be associated with very different *meanings and values*. At one level here we might consider some of the very different ways associated with tattooing. At a somewhat different level we might think of some of the very different ways involved in using the telephone. Different ways often become associated with different locations within social hierarchies or systems of status, recognition and reward - as was evident, for example, in Heath's study. And as our earlier anecdote shows, beyond a certain point, or set of conditions, what appear to be the same ways may actually turn out to have become quite different practices. Furthermore, different ways transform what appear at first to be the same tools/equipment into very different tools, so far as social and cultural meanings and values are concerned. And so on.

Ways, of course, are never completely static. And they are not 'given', or predetermined. Ways are brought into being, and they evolve over time. One especially interesting facet of the present moment in the history of computing concerns the extent to which ways are being invented - often on the run - within educational and wider social contexts. These 'inventions' may vary greatly. In many cases we find funds of knowledge from long-established pedagogical ways being brought to bear on the incorporation of new technologies into classroom learning -

often resulting in some 'domestication' - or accommodation - of the new technology within older 'logics'. Elsewhere, we find attempts to create quite new and different pedagogies around appropriations of computers, in accordance with notions of changed conditions and purposes seen as themselves reflected or inherent in new technologies themselves. In between we find all manner of combinations and permutations.

The following accounts are early attempts to capture these sorts of things, and to comment on aspects which appear to us interesting and illuminating from the point of view of language and literacy education. The ways we describe here are not, of course, ways in the sense of long established *routines* or settled *cultures* as, for example, many of the ways identified by anthropologists are. They should, rather, be seen as moments of cultural (re)production that are related to and participate in much larger individual and collective cultural histories and patterns. We have aimed to produce snapshots of ways at specific points in time; ways that have capacities to be more *or* less enduring. Our interest in them is in terms of what they might illuminate, illustrate, and suggest about (computer-mediated) cultural practices more generally: as so many 'windows' on cultural practice, as it were. We are not concerned with their comparative prospects or efficacies, and we are certainly not implying any normative judgments about or among them.

Take #1: Learning in Year 5 at Abbotsford

From the outside, the Year 5 classroom at Abbotsford State School, which draws on an officially designated disadvantaged catchment on the outskirts of a rural town, looked like a relic from an earlier era: a single-room one-teacher school which, over the decades, has seen successive classroom and administration blocks spring up around it to accommodate a growing population. Stepping through the door, however, we immediately faced visible trappings of the present. Ranged along the back of the classroom were three revamped computers with processing speeds of 486 and 586 CPUs. Two computers were fitted with quad-speed CD-ROM players, one of them was wired to a hand-held scanner as well. The third computer was networked to the Internet via a local public provider and was equipped with Netscape web browsing software. All three computers were linked to the same colour enabled DeskJet printer. In the sequences described below, the computers were being used in four main capacities: for using animated movie making software; engaging in problem solving activities; accessing the Internet; and producing artifacts using desktop publishing software.

The teacher, Robert, pursued integrated approaches to learning and employed a theme based cross-curriculum approach to planning. The theme we observed in operation over several weeks was *Inventions*, and was handled as a unit of work.

Robert used the pedagogical device of activity *rotations* to handle such themes. Large chunks of time were set aside each week during which small groups (3-6 students) moved through a cycle of activities and tasks in different spatial locations. Rotation-based work involved two 90 minute segments of time divided by a break. Each 90 minute segment was broken into three 30 minute blocks. Each block was in turn devoted to a different kind of activity, typically drawing on different communications technologies. Reading theme-related materials (sometimes aloud to a teacher aide) for practice as well as for getting information relevant to their projects, accounted for one block. Working in groups with pen, paper, task sheets, pre-set tasks, and discussion, comprised a second block - and was often concerned with preparing ideas and components to be implemented at the computers. Work at computers made up the third block. Roberts plan was that during rotations the class would move through two complete sequences of activities, to maintain a rate of focused progress, ensure continuity, and provide integration of reading, writing, discussing, and computing activities. Following rotation sequences the class typically came together to discuss issues, problems, discoveries, etc.

Our description focuses on a typical 3 hour period during which the class moved through two complete rotations of activities. Typical episodes have been selected for description.

In one, Sallie, Kate, and Emma were sitting at one computer working on their animated movie. They were using Microsofts *3D Movie Maker* software to produce a movie featuring an invention - in this case, a jet-propelled device for personal aerial transport. As they worked on each scene, they consulted their script overview and discussed character selection, placement, actions and speech, background music and sound effects.

Meanwhile, a group of four students sat at another computer, engrossed in a software program challenging them to construct on-screen a 'working' apparatus that enabled a ball to travel from point A to point B. They discussed possibilities, tested out their ideas, and cheered when they added a successful component to their design.

Mark, Brendan, and Liam sat at the computer with the Internet connection, using a search engine to locate invention-related sites. This was their first experience of the Internet, and Robert had provided a task sheet requiring them to fill in particular information about the web page (e.g., its location or URL, the invention showcased, etc.). The group located a comprehensive and well designed Japanese web site presenting a range of wacky inventions, including dusters for a cat's feet so that the cat can clean your home while you're at work, a hat that incorporates a roll of toilet paper for dispensing 'tissues' to people with severe colds, and the like. While reading and laughing their way through the text they commented on some of the syntax used, and discussed with Robert whether or not the writer spoke English as a second language.

During a second round of activities, a group of students was at the computer with the desktop publishing software. They were learning how to create text boxes, and insert text, graphics, and borders, in order to make posters advertising their movies, and personal invitations to attend the premiere. (As with the scripts and character development for their movies, the ideas and content for the posters and invitations had been discussed and mapped out during previous writing and discussion segments of the rotations. This conceptual work was done with assistance from structured activities provided by Robert - worksheets and question prompts - pertaining to language features of the genres involved. Many activities involved in the unit of work required students to reflect on their work by describing the processes they used to solve a difficulty encountered in, say, using *3-D Movie Maker*, or to evaluate the pluses, minuses, and interesting aspects of a piece of software.) The trio were being introduced to the desktop features by a gentle and unassuming Year 7 student, Amanda. Amanda patiently demonstrated how to perform needed functions, drawing on the studentsexisting knowledge of computing functions. Then one student sat at the computer, mastering the routines while aiming for the textual effects desired - with suggestions from the others on choice of fonts, borders, etc., and technical responses from Amanda when requested.

Meanwhile, other groups of students were variously engaged in searching through newspapers for reports on inventions which they would then use to analyse the structure of the genre, practising for their upcoming oral presentation of their report on an invention or inventor, reading aloud to a teacher's aide, or working on independent projects (e.g., constructing an invention from found objects that will water both the plants and the gardener during hot afternoons). Robert circulated among the groups, monitoring their progress and providing advice or feedback when asked.

Ways of learning at Abbotsford

Abbotsford's ways were characterised by an emphasis on learning *through* technologies whilst learning *about* technologies. The pedagogy was strongly informed by theory. A mix of conventional - traditional, even - and innovative approaches to teaching and learning were employed to integrate use of computer technology into activities in a manner which was as 'invisible' and seamless as possible. Robert described new technologies as providing 'new contexts 'in which to learn. He insisted that the technologies in his classroom not become ends in themselves. Instead, they were employed in ways designed to maximise learning in general, and the development and practice of higher order thinking skills in particular. Classroom activities were scaffolded in a variety of ways. Some employed questions prompting students to reflect individually or in groups on a process or tool and/or to evaluate it (e.g., a piece of software, a reference book). Others employed guide sheets assisting students to work from cognitively simple knowledge (e.g., through literal content questions) to more complex understandings (e.g., through questions requiring students to evaluate, extrapolate, analyse and/or synthesise content and processes). These ways enacted Robert's constructivist theories of learning, and presented opportunities to experiment, explore, play, take risks, and solve problems using resources of more conventional as well as new technologies.

Year 5 operated as a community of learners, enacting a culture of collaboration within which the students exercised a lot of initiative. During small group and whole class sessions students regularly turned to each other for assistance, feedback, and advice: turning to Robert only when a problem or question proved beyond their own means. It was common during rotations to see a student break away from his or her own group/activity at the request of another and, for example, demonstrate how to access a given file or background scene within *3D Movie Maker*, or help with identifying the genre of a particular text. Students were actively encouraged to display and share their expertise for mutual benefit. This was especially evident in peer tutoring sessions run by Amanda to introduce students to new software or hardware, and new applications of familiar software. Robert also actively encouraged collaborative approaches to problem solving through the kinds of activities he structured for students (e.g., pairs searching newspapers for reports; group productions of animated movies), and through his own involvement in shared activities (e.g., helping a student search the Internet and library for information on the Acropolis).

Abbotsford's ways sought and regularly produced multiplier effects. For example, Amanda's peer tutoring sessions enhanced her self-esteem and confidence in herself as someone with expertise to share, as well as maximising opportunities for others to become competent users of computing programs and applications, and to work independently of their teacher in achieving syllabus guidelines (e.g., mastering diverse genres). Further multiplier effects flowed from Robert's practice of integrating new technologies into activities on the principle of using computers for things that are best (or better) done on computers. Learning practices steered well clear of decontextualised and fragmented uses of technologies aimed at technical skill mastery alone, or that otherwise reduced new technologies to mere add-ons or 'uses for the sake of it'. He encouraged use of these technologies to minimise busy or needlessly time-consuming work (such as repeated handwritten drafts, or labour intensive information searches which produced merely equal or inferior data to what could be got using a computer search engine). By such means, students learned both *how* to use a range of new technology applications and processes, and *when* recourse to these provides the best option.

Take #2: Woodville's HyperCard presentation for speech night

Woodville is a geographically isolated rural P-10 school (100 primary and 200 secondary students) in southern Queensland. It receives some additional state funding under the disadvantaged schools project. At the time of observation, the school was served by a Learning Technology Education Adviser (EA) based at a school support centre serving a 150 km radius. During the period observed, the EA was trialing an Apple QuickTake camera and a scanner in activities with teachers and students from three schools. Like the other two schools, Woodville had purchased its own QuickTake camera on advice from the EA. The scanner and a computer with large memory capacity used in the activity we observed were owned by the school support centre, and carried from school to school by the EA on her visits.

The group of Years 8-10 students, and the Business Studies teacher, Rosemary, were working on their project during lunch breaks and in available timetable spaces and free periods. Their HyperCard presentation was to be used at the fast approaching end of year speech night. Produced mainly on Macintosh Performas, it was designed to be integrated into, and to augment, the Principals address, by presenting images of the school year - some captured statically with the QuickTake camera, and others grabbed from video. The EA trained Rosemary and students together in using the equipment. The production process itself was broken into specific tasks, delegated to individuals or pairs of students who had undertaken responsibility for completing

these tasks. At times Rosemary met with the team as a group, and in between they would report to her with photos, video takes, and other artifacts to be incorporated into the presentation.

Rosemary had recently returned to teaching after years away raising a family - "When I left we were in typewriters, but when I came back it was computers". She often felt all at sea with the new technologies, but believed it was crucial for Woodvilles students to have opportunities to experience current technologies. Rosemary often referred in interviews to the community's geographic and social isolation from 'mainstream Australia', expressing concern that the community may be isolated from ideas, and that important changes and opportunities in the cities are simply passing them by. She saw activities with digital cameras, multimedia authoring software, scanners and the like, as a way of providing Woodville students with experiences enjoyed by students in the 'mainstream '(cities). Hence, she was quick to take advantage of the speech night occasion as a pretext for organising the group of students around the project, and to make use of the EAs availability and expertise, and of equipment not available at school.

Seeing Power Point presentation software and HyperCard stacks as 'stuff of the urban present' - a common tool in business circles, and increasingly popular in school settings - Rosemary threw herself into organising, teaching, and learning with these students, with the EAs input, to create an effective HyperCard presentation for a specific purpose within the larger life of the school.

A lunch-time work session began with Rosemary reminding the group that "We're all in this together, otherwise it won't work". The students had been quite enthusiastic about the project at first, but interest began to wane under competition from end of year distractions ranging from tests to anticipation of the long vacation. Time and equipment constraints were urgent. The group had only two days to access the scanner, the computer, and the EA. Rosemary recapped the last group meeting, prompting them for the basic configuration of stacks she had suggested the previous week; that is, three stacks of unlimited 'cards' or slides built around the outline the Principal had written for her intended speech. Rosemary suggested using only three different backgrounds for the presentation - one for each stack - and allocated the task of snapping a digital shot of the school garden and administration block for the first stack to a lad sitting near her.

Rosemary talked about the audience for the presentation - parents and visitors - and

emphasised that the students were actually working for the Principal in preparing the presentation. Pairs and sub-groups within this group had earlier been given specific tasks to do, such as using the digital camera to photograph tuckshop staff and specialist teachers (e.g., physical education, music, etc.), grabbing image stills from video and converting them to digital images, interviewing staff and students, or using text art software to create headings and the like. Rosemary spent the remainder of the lunchtime session checking the progress of each task and working with the two students charged with setting up the 'cards' on the computer. Because time was short, she simply showed and told the different students how to use the equipment, and explained as economically as possible the steps needed to complete their respective tasks. The EA scanned those photos already taken while we interviewed her. (Rosemary and the EA subsequently completed the scanning and final production of the cards, and the EA burned a CD-ROM at the school support centre to provide a permanent record of the project. The presentation was very well received by the community.)

Woodville's ways of making a presentation

Woodville's ways of producing a HyperCard presentation reflect elements of (what might be called) cultural 'Taylorism 'and/or 'Fordism' (Watkins 1991). These are evident in the hierarchies involved in different aspects of the production process, the extrinsic forms of motivation employed as Rosemary struggled to keep the students interested and involved, the division of the job into so many tasks, and fragmented involvement of participants as a result. For student participants, choice about content was shaped by the contours of the Principal's speech. The format for gathering and collecting data was pre-given, in the form of a chart of components (headings) and elements of components (sub headings), presented to the students, who worked to a pre-determined formula - although they had some autonomy over detail (what pose they would photograph a teacher in; where the sports field would be photographed from, etc.).

From another angle, Woodville ways exemplify values and practices of mobilising and organising people to make something happen, making do with what is available, sharing resources, and the like. They reflect an interesting mix of 'finding pretexts', being constructively 'opportunistic', and having a go. Rosemary's starting point was a personal wish to keep students in touch with what she saw as the technological and cultural mainstream. In many ways her parameters and options were circumscribed by her own lack of knowledge, as well as by the EA's preferences and choices of projects to promote technological learning: namely, a certain range of multimedia productions based on particular applications. Given this, speech night provided a

pretext - an opportunity to find a use for what was pre-given; a problem to which an extant solution could be addressed. (Many writers would see this as a specific exemplification of the whole 'computers in education scene': i.e., we have all these things, now how can we find educational uses for them? See, e.g., Bigum and Kenway 1997). Rosemarys seizing on this pretext created a context for students to gain some awareness of certain new technologies, some of their possible uses, and some of their potential links to other technologies (videos and computers; word processing and scanning, etc.); as well as opportunities to work with some of them. 'Having a go' involved Rosemary committing herself and securing student commitment to seeing a task through to completion, despite the limits on equipment and immediate access to expertise. This entailed 'getting by 'as best they could, making use of the availability of the EA and support centre equipment on terms beyond their control. That anything happened at all here is a testimony to considerable good will, hard work, and performance beyond the call of duty by the various participants.

The outcome was a particular kind of slide show type presentation. It contained text, photographs, and video snippets as illustrations of what the Principal was communicating. It was a prop more than a production in its own right. It was very much a functional and pragmatic product, as well as being closed-ended. Throughout the process of constructing the presentation there were few opportunities for exploration and experimentation, risk-taking and hypothesising, because of the nature of the task and the larger circumstances surrounding it - including reliance on the expertise of the EA. The product, and the uses of the tools that went into it, can be seen as mediating a whole range of social and power relationships between the various participants involved - including the community members who were informed and entertained by the presentation.

Take #3: PowerPoint and The Simpsons

Jack (15 years) was sitting at the family computer, demonstrating what had engrossed him for two weeks of his school holidays. The computer was a 133 Pentium desktop with an 8-speed CD-ROM player, colour printer, an array of current software, and a public-provider connection to the Internet. With a few deft clicks of the mouse Jack opened the PowerPoint program he had recently installed on this computer, selected a file from the directory, and the screen filled with the serene blue and white of a limitless sky flecked with clouds. Suddenly, the screen burst into a bright cacophony of sound, colour and movement as the familiar title from an animated television series, *The Simpsons*, dropped onto the screen to the opening lines of the shows theme song. This was followed in quick succession by a selection

of images of the Simpson family going about their everyday lives. The title page gave way to a parade of slides, one for each family member and major character in the show. In order of appearance these slides depicted Homer, Marge, Bart, Lisa, Maggie, Itchy and Scratchy, Mr Burns, Ned Flanders, Krusty, Apu, Moe and Barney, as well as providing a credits page.

Each slide showed a full colour image of the character, accompanied by a few pertinent statistics (e.g., age, occupation) and followed by a short text headed: 'little known facts'. Images and lines or phrases of text appeared in synchronisation with the melody of the song selected to accompany the particular character depicted on each slide. In all, the slide show ran for about six minutes.

"Did you use a manual to help put your presentation together?", we asked. "Oh no", Jack replied. "I just heard from my friends at school that PowerPoint is a *really* cool program. You can do heaps of stuff on it". The first time Jack had seen a PowerPoint presentation had been at his school's Sports Awards night a few months earlier. "It was all right, but it was just headings for the topics for the night. The backgrounds were cool, though". There were few images in the school presentation, but Jack had been impressed by the idea. He recounted how his best friend, Joe, had later described a PowerPoint presentation he was putting together at home, show casing *The Simpsons*. Jack began to realise some of the possibilities this kind of software might have for exploring his own interests in The Simpsons.

Joe helped Jack to get started by giving him a disk of the Simpsons presentation Joe had put together. Spending at least an hour and a half each day for two weeks of his school holiday on his project, Jack searched official and unofficial *Simpsons* web sites on the Internet, down loading additional graphics, scanning in images, and gathering information for the biodata to accompany each character. He supplemented this with information from his *Simpsons* collector cards. Jack also began experimenting with the palette of functions built into the software and found he was able to attach sounds and music to each slide. This sent him on another search of the Internet, where he found hundreds of sound files. Some were compatible with the PowerPoint software. Others had to be converted to the right format using software that he and his father (Robert, the Abbotsford Year 5 teacher) had spent considerable time locating and down loading from the Internet. Further ideas and hints for using PowerPoint effectively were gleaned from his mates at school. Jack also discovered the *animate picture* function tucked away in one of the menu bars. This function enables the user to control the ways images appear on the screen (e.g., 'fly from right') and come to rest at a location preprogrammed by Jack. He spent hours experimenting with the effects of this function - occasionally resorting to the *Help*

function built into the program - before using it in his presentation, creating a show filled with movement and vitality.

Jack's ways with PowerPoint

Three dimensions of Jack's ways with PowerPoint stand out. The first is that he drew on, and added continually to, a strong conceptual understanding of computer 'workings', 'logics', and 'potentials', built on a cultural perception of the technology as 'tool n toy'. Making his PowerPoint presentation provided a context for adding to his repertoire of technical skills and understandings whilst drawing on what he already knew. He used his existing knowledge to predict possible functions and capacities of the PowerPoint program, and tested his hypotheses. By this process he added to the range of what his presentation could accommodate. He practised risk-taking ("I wonder what this might do") and problem-solving: eschewing manuals, and only resorting to PowerPoints online *Help* menu when he got stumped. This process and growing stock of expertise extended as well to myriad Internet resources and functions (such as finding software to convert one kind of sound file to another which was compatible with PowerPoint).

Jack's ways contrast sharply with what might be described as characteristically *school* ways, which are inherently tied to what we have elsewhere called "modernist spaces of enclosure" (Lankshear, Peters and Knobel 1996). His project was open-ended, intrinsically motivated, and 'uncurricular '- in that it was not subject to measurement, categorisation/classification by subject or genre, reporting, grade commodification, remediation, or timetabled closure. It was quintessentially *liberal*, in the sense of existing for its own sake. The Simpsons Presentation emerged from a popular youth culture space, rather than from teacher or other school-bound directives and routines. Indeed, Jack explicitly contrasted his presentation with the one he encountered within the formal school context. He had multiple intended audiences: himself (primarily), his mates at school, and people at large who are interested in *The Simpsons*. The presentation evolved continually on the basis of experimentation (techniques and effects), exploration (hunting down new resources), and the personal/self-directed pursuit of expertise.

More generally, Jack's ways were strongly embedded in GenX-postmodern youth culture Rushkoff 1994, 1996). His show developed a complex intertextuality which

built on the intertextuality of the TV show itself. Beyond this, Jack created his own cross references within the way he organised and arranged the slides (e.g., cross references between characters and links within the presentation, and creating implied links to particular episodes of *The Simpsons* through his choice of music and images accompanying the text on each slide). His work reflects his cultural alliances with a particular group of mates and unfamiliars who are into the Simpsons - a world in which kids are more media savvy, more 'meta', than adults, and where a fine border line is negotiated constantly between sacred and profane, conventions and anti-establishment positions, attitudes, and practices, and so on. This comes home, graphically, in what might be seen as Jack's humorously irreverent treatment of PowerPoint software itself, subverting its marketing-oriented slide show templates which were purpose-built for business suit culture.

Take #4: GRUNT and the Virtual Valley II Project

Virtual Valley II was initiated by CONTACT Inc., a non-profit company supporting youth arts, cultural development and training. CONTACT Inc., the radical offspring of Michael and Ludmila Doneman (also MWK http://mwk.thehub.com.au), is part of the ongoing *Making Space* community-based project. This project aims to develop a safe and comfortable, large-scale, multi-purpose youth space, and a place for community groups and other youth organisations to converge and interconnect. This physical space is located "between the Roxy and the police beat"in Brisbanes "Valley", and is known affectionately as GRUNT (see also: http://www.odyssey.com.au/ps/kno/grunt/grntmore.htm). The emphasis is on support for enterprise and self sufficiency. Unlike drop-in centres and similar facilities, GRUNT, with its online telecentre and multimedia laboratory, works to provide inner city youth with "training in vocational skills, in the mastery of the new information technology and in planning, management and life skills" (Stevenson 1995: 4).

GRUNTspace consists of three main areas defined within a 100 square metre shell on the first floor level. One area is used mainly for art exhibitions and performances. A second is a general purpose meeting, 'hanging', and administrative space, furnished with deep comfortable chairs and decorated with paintings and collages, plus the occasional prop from past performances. The third is GRUNTs main production area with its two adjourning offices. This has been spray painted Star Trek silver, and is equipped with ten desktop computers with minimum processing speeds of 486. A local area network wires each computer to common online storage areas as well as to the Internet . An urban-industrial 'feel ' has been given to the monitors. Metal garbage bins are placed over them, with screen-sized holes cut into the metal of each

bin. The resulting flap of metal is peeled up and back like the peak of a baseball cap. The computer boxes sit on tables covered completely by synthetic green sward, leaving only each keyboard and mouse visible. Making the space as 'un-school-like' as possible is an explicit operating principle. Multimedia equipment available to GRUNT users includes colour flatbed scanners, current sound, text and image authoring software, Internet browser software and HTML editors, data panels and projectors, and the like.

Virtual Valley II ran in the last half of 1996. (The original Virtual Valley project ran in 1995. Its goal was to produce an "alternative users guide to the Valley" - an alternative to 'official' tourist brochure representations. It presented work by nine young people who used the Valley for work or recreational purposes and held strong opinions about the Valleys role in 'Australia's most liveable city' , and about the urban renewal process underway in the area at the time. The result was a website and a booklet designed to guide visitors "through a number of interesting cultural sites using maps and postcard images", as well as a heightened sense among participants of belonging to a particular community that was the Valley. For quotations, see http://www.odyssey.com.au/ps/GRUV/vvalley/welcome.html). Virtual Valley II was "designed to encourage young people to map the Fortitude Valley Area ... in ways that (were) culturally relevant to themselves and their peers" (ibid). Two inner city schools were involved. We focus here on the cultural production of students from one school, serving Murri youth. These students and their teachers were introduced to the Internet by the CONTACT team, and shown how they could claim spaces within it for their own purposes.

Participants met one morning a week over two months. Sessions varied in specific content, and were divided broadly into two approaches to the overall task. One explored 'identity' in a real life workshopping mode. This worked with the preferred medium of the participants - painting, drawing, and collage. Performance art/drama also was available, but since it was not a preferred medium it was used only minimally. The other focused on learning technical aspects of web page development, including basic hypertext markup language and web page design principles, using digital cameras, manipulating the resulting digital images and anchoring them to web pages, and using flatbed scanners. Students also gathered material for their web pages on walks through the Valley, using digital and disposable cameras, sketch books and notepads. Students began compiling web pages by creating large-scale, annotated collages of aspects of the Valley that were significant to them. Collages comprised photocopies of digital and camera images they had taken of themselves, their friends, and the Valley area, plus drawings and found objects (e.g., food labels, ticket stubs, bingo cards, etc.). They were then pared back to key images and passages of text as each student prepared a flowchart depicting the layout and content their web page or pages. During the last month of

the project these flowcharts were actualised as web pages (for Virtual Valley II see http://www.odyssey.com.au/ps/GRUV/vvalley/phase2.htm).

The end result is a fascinating look at the Valley through the eyes of these participants in its everyday cultural (re)creation. In a typical example, Justin launches his virtual tour of the Valley with word bites that capture poetically images and activities around him:

People allsorts

Ice-cream parlour allkinds

Timezone fun

Dragons

Temples colourful

China Town lots of people
(http://www.odyssey.com.au/ps/GRUV/vvalley/mis/justin.htm)

Justin's text is printed in large green fonts (Courier and Times New Roman). Capital letters and italicised words, plus two photographic images, add further details to his pared-down text. The first image depicts the cultural diversity of the people in the Valley. The second underscores fun experiences at Timezone by showing a video game in action.

Following this timeless description of his response to the Valley, Justin shifts to a recount genre, recalling highlights of a particular stroll through the Valley with his class.

susan pretended to be opal

winney and we was the audience

one group was police the others

was murries and shop owners after all

that we did some drawings . . . (ibid)

The students arrived "with cut lunches and fireworks energy". They commandeered the space, making it their own. GRUNT staff and Murri teachers who came with the students responded in turn. For the duration, GRUNTspace became Murrispace: in the physical and virtual domains alike. Learning agendas were set by the students themselves, and the adults became "part of an interface "between student's expressed interests and tangible products of learning. The overall context became one of "policy on the fly and curriculum on the fly". GRUNT staff and the Murri teachers worked to mobilise and help focus student energies in ways that realised purposes that were meaningful to the students.

Virtual Valley ways

Virtual Valley's ways with windows enacted principles and goals that define GRUNT as a distinctive cultural enterprise, beginning with the principle that this "isn't school". The overt aim was to create a learning context that was as informal, unstructured, non-regulatory, and responsive as possible. A maximally open, experimental, exploratory space was created within broad tolerance parameters consistent with meeting the duty of care. The ideal was supported with adult-student ratios of around 1:3. In the company of adults, students set out into the Valley with digital or disposable cameras and freedom to frame their own subjects, and worked with photocopiers and other equipment to create and reproduce images which they collated to form visual narratives. These were duly supplemented with written texts and became bases for constructing Web presentations.

These ways also reflected the desire "to create a distinctively Murri learning space within the Valley, even if only for short periods". Meeting aunties and uncles in the Valley and visiting favourite haunts associated with life outside school became an inevitable part of learning routines, and were reflected thematically in what the students produced.

The Virtual Valley II project can also be seen as enacting an investment in exanding future prospects for Murri cultural, social, and political presence in cyberspace. New technologies were approached very much in terms of providing media and spaces for *realising* identities as Murri youth. Elements of Murri youth cultures were explored amd researched within virtual settings (e.g., by reference to extant Web sites like Black Voices and Perfect Strangers), as well as within real life settings (the 'real' Valley). As conventional physical forms of graphic and written texts and real life experiences were carried into virtual space, students became aware of both spaces as being viable and important sites of practice for identity politics.

Reflections

Such truncated discussions cannot do justice to the depth, richness, and subtlety of social practices like those addressed here. Yet, even the short distance our descriptions go is enough to indicate that in our present clamour to technologise learning we are in danger of shortcircuiting important issues and principles and, in the process, shortchanging teachers and learners.

Variations among the ways reported here show that access is a much more complex matter than merely putting hardware and software in schools (or homes). 'The same tools 'are by no means the *same tools*. They become very *different* tools in the presence of the different funds of knowledge people bring to the tools when they pick them up. Issues of physical availability aside, PowerPoint was appropriated in profoundly different ways, and for very different purposes, from the appropriation of HyperCard at Woodville. The result is markedly different literacy events and textual productions between the cases. There is nothing new here. In the hands of Heaths Townspeople participants, books and pencils mediated very different educational performances from those they mediated among Roadville and Trackton participants respectively (Heath 1983). Having physical access to a pencil or a Pentium is a different matter from having access to funds of knowledge and acquisition histories (Gee 1996) that enable certain practices to be engaged, and performances elicited, through that physical availability. This, in turn, is a very different matter from having having power to influence what kinds of performance are attached to what kinds of further opportunities, social rewards, and life chances - and vice versa.

This is *not*, of course, a reason for skimping on physical provision. That some learners have greater physical access to tools (or physical access to greater tools) than others inescapably sets up *conditions* for unequal opportunities and outcomes - especially when the tools in question are part and parcel of esteemed and rewarded social performances. From this perspective, Rosemarys students were objectively at a disadvantage by comparison with Jack, the Abbotsford students, and the Murri students learning at GRUNT, when it came to extended opportunities for hands-on experience - different funds of knowledge and availability of expertise notwithstanding. We would argue that as formal education becomes increasingly devolved to local levels, it becomes absolutely essential to establish guarantees that limit physical access differentials as far as possible. Anything less is socially unjust.

At the same time our snapshots imply that *technical* proficiency accounts for rather little of the variation between the ways with Windows we observed. They suggest that even if technical training - i.e., training in applications and processes - were held constant, literacy events drawing on these technical proficiencies would vary greatly. Here again, we have known this for a long time but have failed to build the insight into inclusive and democratic educational practices. If anything, the current technicist fetish evident in language and literacy policy emphases are taking us in the opposite direction. Many current approaches to remediation, diagnosis, assessment, and reporting privilege code breaking and limited aspects of text participation over other essential dimensions of becoming successful readers (c.f., Freebody 1992). This creates contexts in which different cultural capitals and funds of knowledge can play out in ways that intensify unequal opportunities for access to social goods (Gee 1996; Lankshear 1996). Under such conditions, current demands for more professional development and inservicing are often under-informed, and betray a magical consciousness (Freire 1972) of the powers of training packages.

As with the issue of access, however, this does not mean holding back on demands for more and better professional development and inservice teacher education - or, for that matter, preservice teacher education! Quite the opposite. It means, rather, that we need to make better informed demands, and to meet these demands with better informed responses. This entails widening our focus on the issues surrounding the role and place of new technologies within education generally, and literacy education specifically. Apart from anything else, efforts to better prepare ourselves for integrating new technologies into successful and inclusive language and literacy education must include serious engagement with practices, theory, and research which identify and explain differences among ways with words and Windows, and the social, economic, and cultural legacies of these differences under present conditions.

Right now, we are caught up in policies and processes of further technologising education without the necessary philosophical base and political commitments to give weight to policy rhetoric about new technologies contributing to making education more equitable, inclusive and empowering. What kinds of social *practices* - computer-mediated and otherwise - will contribute to making more equal the prospects of *all* human beings to live more satisfying and dignified lives (c.f., Paulo Freires notion of humans living their humanity more *fully*. Freire 1972)? What *principles* of economic and social distribution are presupposed by this ideal? What role can and ought education to play in *identifying and promoting* these principles, and practice that accords with them? On what bases should we estimate the educational worth of varying social and cultural *ways* (with words, Windows, whatever)? What is the significance of the fact that the contemporary technological revolution is accompanied by economic and social policies and practices that are increasing dramatically the income gap between the top 10% and the rest within societies like our own? (Gee, Hull and Lankshear 1996; Reich 1992).

Unless and until our conceptions, practices, and policies concerned with (language and literacy) education and new technologies - from issues of access, professional development, and teacher education, to concerns about inclusive curriculum and educational purposes - are informed by deep and protracted engagement with such issues, this latest round of 'technologising education' will merely position 'ways with Windows 'where we were under earlier technological regimes. This was a place where education was already an expensive and, for many, soul-destroying, investment in legitimating the principle: Some ways will be honoured, and others will not.

Accordingly, we conclude that whatever else we do pedagogically with our new technologies, we should aim to integrate them into informed practices of critical social literacy (Freire 1972; Shor 1992; Muspratt, Freebody and Luke in press). Unfortunately, there is no easy recipe or short cut to meeting that aim. We hope, however, that this paper, its bibliographic references, and their extended family of references to resources, research efforts, reported practices, and informing theories, provide at least a coherent starting point for our continuing growth as educators for better times.

http://www.schools.ash.org.au/litweb/ways.html

Note and Dedication

We wish to thank Eileen Honan for providing excellent research and writing assistance which has helped inform this paper. We also thank our research informants, who have been most generous with their time, energies, and trust. Some of the data collected here was gathered in the larger context of a research project funded under the Children's Literacy National Projects program and administered by the Commonwealth Department of Employment, Education, Training and Youth Affairs. The views expressed herein do not necessarily represent the views of the Commonwealth Department of Employment, Education, Training and Youth Affairs. Finally, we dedicate this paper, in humility, to the memory of the inspirational life and example of our esteemed compañero, Paulo Freire, from whom we have learned many of the things we hold most dear.

References

Aronowitz, S. and Giroux, H. (1993). Education Still under Siege. Westport: Bergin & Garvey.

Bigum, C. and Green, B. (1992). Technologizing literacy: the dark side of the dream. Discourse: the Australian Journal of Educational Studies, 12 (2): 4-28.

Bigum, C. and Kenway, J. (1997). New information technologies and the ambiguous future of schooling - some possible scenarios. In A. Hargreaves, A. Lieberman, M. Fullan, D. Hopkins (eds) International Handbook of Educational Change. Toronto: OISE (to appear).

Bruce, C. (1996). Technology as social practice. Mimeo.

Clinton, W. (1997). Text of the state of the union address. The Washington Post, February 5 (http://www.washingtonpost.com/wp-srv/national/longterm/union/uniontext.htm, down loaded 20-2-97).

Franklin, U. (1990). The Real World of Technology. Montreal: CBC Enterprises.

Freebody, P. (1992) A socio-cultural approach: Resourcing four roles as a literacy learner. In A. Watson and A. Badenhop (eds) Prevention of Reading Failure. Sydney: Ashton Scholastic, pp. 48-60.

Freire, P. (1972). Pedagogy of the Oppressed. Harmondsworth: Penguin.

Gee, J. P. (1996). Social Linguistics and Literacies: Ideology in Discourses. 2nd edition. London: Taylor & Francis.

Gee, J. P., Hull, G., and Lankshear, C. (1996). The New Work Order: Behind the Language of the New Capitalism. Sydney and Boulder, CO.: Allen & Unwin and Westview Press.

Green, B. and Bigum, C. (1996). Hypermedia or media hype?: new technologies and the future of literacy education. In G. Bull and M. Anstey (eds) The Literacy Lexicon. Sydney: Prentice Hall, 193-204.

Heath, S. B. (1983). Ways with Words: Language, Life and Work in Communities and Classrooms. Cambridge: Cambridge University Press.

Illich, I. (1971). Deschooling Society. London: Calder Boyars.

Kearns, D. and Doyle, D. (1991). Winning the Brain Race: A Bold Plan to Make Our Schools Competitive. San Francisco: ICS Press.

Kemp, D. (1997). The National Literacy Policy for Australia. Belconnen, ACT.: Language Australia.

Lankshear, C. (1997). Meanings of literacy in educational reform. Invited paper presentation to Department of Education, University of East Anglia, and Warner Graduate School of Education, University of Rochester, March 1997.

Lankshear, C. and Knobel, M. (1997). Literacies, texts and difference in the electronic age. In C. Lankshear, Changing Literacies. Buckingham and Philadelphia: Open University Press, 133-63.

Lankshear, C., Peters, M., and Knobel, M. (1996). Critical pedagogy and cyberspace. In H. Giroux, C. Lankshear, P. McLaren, and M. Peters, Counternarratives: Critical Pedagogies and Cultural Studies in Postmodern Spaces. New York: Routledge, 149-88.

Moll, L. (1992). Literacy research in community and classrooms: a sociocultural approach. In R. Beach, J. Green, M. Kamil and T. Shanahan (eds) Multidisciplinary Perspectives on Literacy Research. Urbana: NCRE/NCTE, 211-44.

Montgomery, K. (1996). Children in the digital age. The American Prospect 27

(July-August): 69-74 (http://epn.org/prospect/27/27/mont.html).

Muspratt, S., Freebody, P., and Luke, A. (eds) (in press). Constructing Critical Literacies. Cresskill, NJ: Hampton Press.

National Commission on Excellence in Education (1983). A Nation at Risk. The Imperative for Educational Reform. Washington D.C.: U.S. Department of Education.

Reich, R. (1992) The Work of Nations. New York: Vintage Books.

Rushkoff, D. (ed.) (1994). The GenX Reader. New York: Ballantine Books.

Rushkoff, D. (1996). Media Virus: Hidden Agendas in Popular Culture. New York: Ballantine Books.

Shor, I. (1992). Empowering Education: Critical Teaching for Social Change. Chicago: University of Chicago Press.

Stevenson, P. (1995). Making space: for those who invent tomorrow, a report on the feasibility of a multi-purpose youth facility for Brisbane. Brisbane: Queensland Department of Tourism, Sport and Racing and Queensland University of Technology Academy of the Arts.

Watkins, P. (1991). Knowledge and Control in the Flexible Workplace. Geelong: Deakin University Press.

Winters, K. (1996). America's technology literacy challenge. Washington D.C.: U.S. Department of Education, Office of the Under Secretary, k.wintersinet.ed.gov posted on acw-lunicorn.acs.ttu.edu 17 February 1996.